includes efforts at extension of this technique to include localization of intracellular RNA and neurotransmitter substances, as well as application of metal-complexed DNase to metaphase chromosomes. The investigations also include the use of metal-complexed enzymes as vital stains prior to fixation and thin sectioning of tissues. Further work is in progress to characterize the presumed mercuric–DNase complex in detail.

In view of the possibility that enzyme-substrate interactions can occur between an embedded substrate and an aqueous enzyme solution, it would seem reasonable to attempt the complementary experiment of attempting to locate intracellular enzyme by applying a solution of metal-complexed substrate to tissue sections.

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RICHARD ROPPEL
CARL MELTON

Battelle Memorial Institute,
505 King Avenue,
Columbus 1, Ohio.

GENETICS

Karyotype of *Theligonum cynocrambe* L.

THE family Theligonaceae has one genus *Theligonum* L. (= *Cynocrambe* Tourn.) in which four species have been reported: *T. japonicum* Okubo and Makino, *T. macranthum* Franch., *T. cynocrambe* L. and *Cynocrambe formosana* Ohwi. Two of these species have been cytologically examined previously by other workers. Schneider[1] reported that *T. cynocrambe*, a Mediterranean species and an annual, had a somatic chromosome number of $2n = 20$ and a meiotic count of $n = 10$. In contrast to this, Sugiura[2] found that *T. japonicum*, a perennial from Japan, had a meiotic count of $n = 11$. He did not report on the somatic chromosomes of this species.

In 1961 seed of *T. cynocrambe* was collected from the Piana degli Albanesi district of Sicily about ten miles south of Palermo by Dr. C. D. Cook. Plants were grown from this seed, the chromosome complement was examined, and a voucher specimen deposited at the British Museum Herbarium.

Root tips were pre-treated for 2 h in 0·05 per cent colchicine solution and fixed in 3:1 alcohol/acetic. They were then hydrolysed for 10 min in hydrochloric acid at 60° C, stained for 1 h in Feulgen, mounted in aceto-orcein to counterstain, teased and squashed. The chromosome number of $2n = 20$ was observed in all cells. This agrees with the count made by Schneider in 1914.

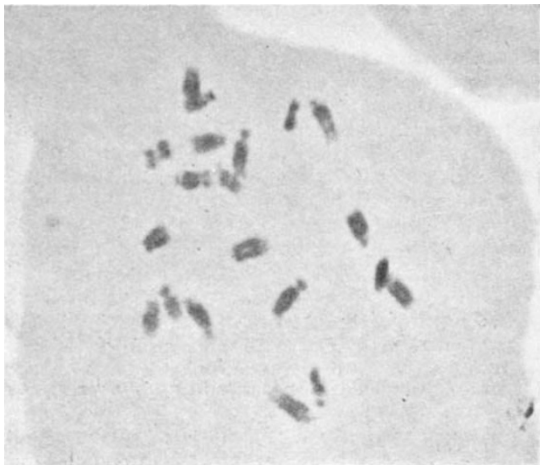

Fig. 1. Somatic metaphase plate from a root tip of *Theligonum cynocrambe*, $2n = 20$ (× 2,000)

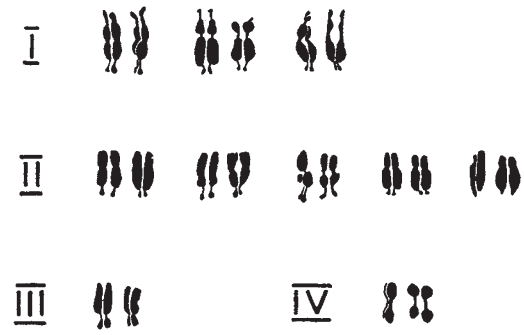

Fig. 2. Karyotype analysis of *Theligonum cynocrambe* (× 3,000)

The degree of chromosome contraction, due to the colchicine pre-treatment, varied slightly from cell to cell, but this method allowed karyotype analysis to be carried out with accuracy. Four groups of chromosomes can be distinguished (Figs. 1 and 2). (I) Three pairs of large acrocentric chromosomes ranging from 2·6 to 2·8μ in length; (II) five pairs of small acrocentric chromosomes ranging from 1·7 to 2·0μ in length; (III) one pair of acrocentric chromosomes with more prominent short arms, the short arm 0·6μ and the long arm ranging from 1·3 to 1·4μ in length; (IV) one pair of metacentric chromosomes, 1·7μ in length.

Chromosome morphology was seen best in those cells where the pre-treatment had produced the least contraction of the chromosomes but had clarified the position of the centromere and secondary constriction regions. The members of group I have two secondary constrictions and in those of group II there is evidence of a single secondary constriction. Drawings from root-tip cells by Schneider[1] do not show any of these details.

Similar karyotype analysis of the other species of this genus will be of interest in view of the different basic chromosome numbers reported. These will be done as material becomes available.

N. M. GREGSON

Department of Genetics,
University of Liverpool.

[1] Schneider, H., *Flora*, **106**, 1 (1914).
[2] Sugiura, T., *Cytologia*, Fujii Jubilæ Vol., 845 (1937).

A Red Eye Colour Mutation in *Culex pipiens* after X-irradiation

FOUR 1–2-day-old males of *Culex pipiens* were irradiated with a dose of 4,000 r. The mutant 'red eye' (*r*) was isolated from F_3 cultures of two of the irradiated males (♂ II and ♂ IV). From male II, there were three red-eyed females which arose out of a single F_2 brother–sister mating; from male IV, 80 red-eyed females and one red-eyed male from 14 F_2 brother–sister matings. According to the experimental procedure, this means that at least one sperm from male II and at least fourteen sperms from male IV carried the mutation *r*. Thus, the same mutation was recovered in parallel from two irradiated males. The clustered appearance of the mutation in male IV was presumably caused by the occurrence of the mutation in a spermatogonial cell.

While the normal eyes of the larvæ, pupæ, and adults appear pigmented dark brown to black, the mutation *r* causes a red eye colour in place of black. In the late embryo of the normal animals, one recognizes two brownish red eye spots, which in the larvæ darken to brown or black. The eyes of the advanced larvæ, pupæ, and adults appear completely black. The embryonic eye spots of the mutants, on the other hand, are faded orange in colour. The orange hue becomes more intense and turns to red in